

# Supplemental Material

*CBE—Life Sciences Education*

Finkenstaedt-Quinn *et al.*

Supplemental Information:

Postsecondary Faculty Beliefs About the Use of Writing-based Pedagogies in the STEM Classroom

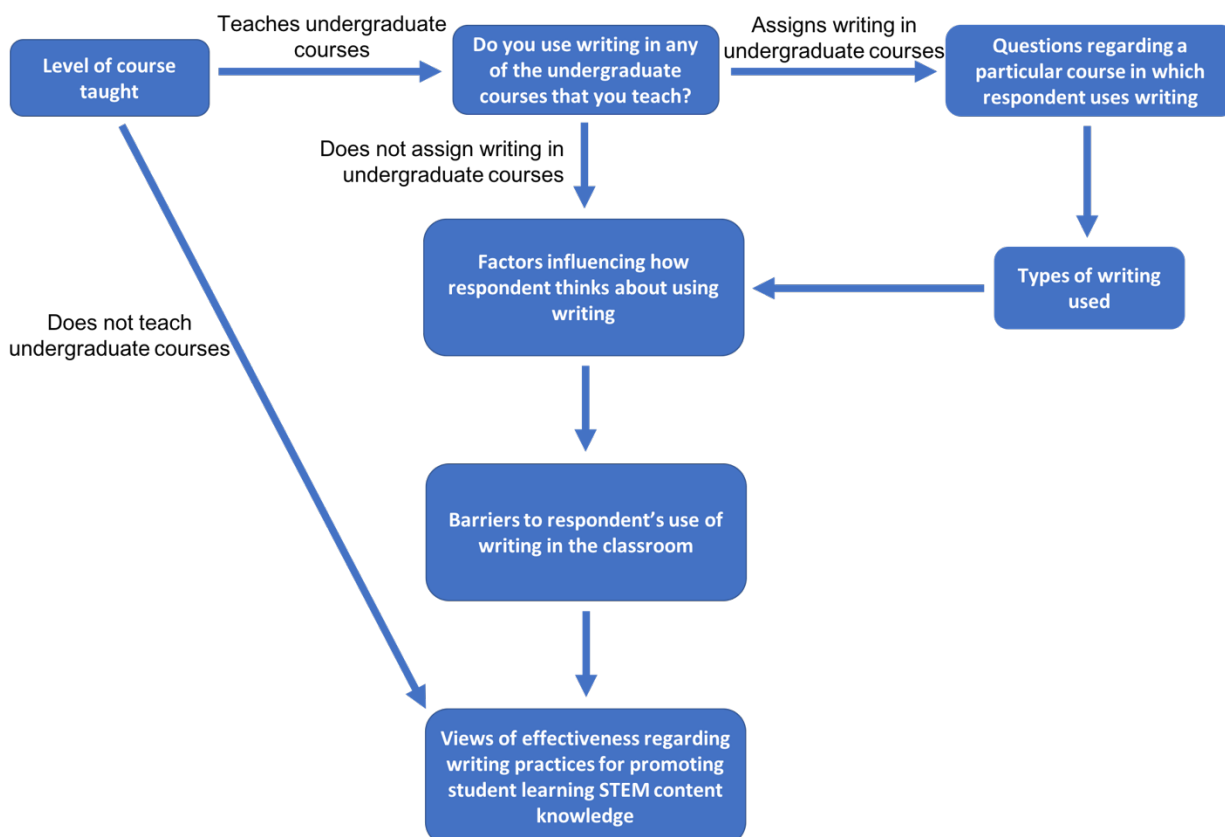


Figure S1: Flowchart for how respondents moved through the survey questions.

Table S1: Demographics. Assorted demographics collected from our survey respondents.

Gender	
Female	27%
Male	67%
Prefer not to respond	5%
Racial/Ethnic Background	
African American	2%
Asian/Pacific Islander	11%
Hispanic or Latino	3%
White	77%
Mixed	3%
Prefer not to respond	4%
Number of Years Taught	
1-5	18%
6-10	15%
11-15	13%
16-20	10%

Over 20	43%
<b>Position</b>	
Assistant Professor	18%
Associate Professor	20%
Full Professor	45%
Lecturer	9%
Other*	8%
*In generating the email list, some instructors who are not faculty were included (e.g. postdoctoral scholars). As this only made up a small portion of our respondents, we refer to all respondents as faculty.	

#### SI - Survey Cleaning:

At closure of the survey 4,644 were completed and there were an additional 2,184 partial surveys, which resulted in an overall response rate of 24%. Both the submitted and partial surveys were evaluated with an 80% response cut-off with respect to the first ten questions, which were the questions pertinent to the research questions guiding this study, to indicate completion as a way to maximize the sample size while minimizing partial data. This cut-off threshold was based on a discussion with authors and a survey analyst from the survey research center based on initial analysis that showed a negligible difference between 80% and complete responses. For participants who did not see all of the first ten questions due to the logic included in the survey, the 80% cut-off rule was still applied using the subset of the first ten questions as reference. Additionally, duplicates and schools where we only received responses from one discipline were removed. The latter were removed as part of making our sample more representative of STEM research-intensive institutions. With our 80% cut-off, we recognize that some of the participants did not respond to every question and resulted in some variation in response count per question. As these variations may impact the interpretation of results when comparing between questions, the weighted response counts (denoted by  $n_w$ ) are presented both throughout the main text and in the SI.

#### SI – Post-stratification approach

The 63 schools were first divided into four equal groups based on the total number of STEM faculty (0-350, 351-450, 451-749, 750 or more). Within each of these four groups, weighting adjustments were made so that the number of respondents in each school matched the STEM population total for the school. An adjustment was then made so that the totals by STEM faculty type (Chemistry, Life Sciences, Computer Science, Engineering, Geosciences, Mathematics, and Physics) within the group of schools matched the totals for all the schools within the group. This process was iterated until both sets of totals or marginals (school size, STEM faculty size) matched.

**Table S2: Breakdown of the level of courses taught by writing users and non-users.**

Level of Course	Faculty who assign writing	Faculty who do not assign writing
Introductory	14% ( $n_w = 430$ )	28% ( $n_w = 379$ )
Upper Division	43% ( $n_w = 1345$ )	44% ( $n_w = 606$ )
Introductory and Upper Division	43% ( $n_w = 1339$ )	28% ( $n_w = 388$ )

**Table S3: The course size breakdown for courses where faculty report assigning writing.**

Course Size	Percentage of faculty who assign writing
25 or fewer	33% ( $n_w = 1017$ )
25 – 50	32% ( $n_w = 993$ )
50 – 100	22% ( $n_w = 673$ )
100 – 500	13% ( $n_w = 410$ )
500 – 1000	.6% ( $n_w = 19$ )
Over 1000	.3% ( $n_w = 9$ )

**Table S4: Faculty use of writing practices –  $n_w$  for each question.** The value for  $n_w$  is rounded to the nearest whole number.

	$n_w$ - Percent of WA who assign the practice
<i>Goal-directed Practices</i>	

Learning to write	3104
Writing to demonstrate mastery	3105
Writing to learn	3100
<i>Process-targeted Practices</i>	
Scaffolding a long piece of writing	3093
Peer review between students	3095
Revision based on feedback	3098

**Table S5: Faculty use and views of writing practices –  $n_w$  for each question.** The value for  $n_w$  is rounded to the nearest whole number.

	$n_w$ - Views for faculty who assign writing	$n_w$ - Views for faculty who do not assign writing
<i>Goal-directed Practices</i>		
Learning to write	3025	1328
Writing to demonstrate mastery	3021	1329
Writing to learn	3023	1328
<i>Process-targeted Practices</i>		
Scaffolding a long piece of writing	2989	1318
Peer review between students	3004	1318
Revision based on feedback	3015	1322

**Table S6: Factors that influence the subjective norms of writing practices –  $n_w$  for each question.** The value for  $n_w$  is rounded to the nearest whole number.

		$n_w$ - Faculty who assign writing	$n_w$ - Faculty who do not assign writing
<i>Subjective Norms</i>			
1	Writing is not important in my discipline	3086	1370
2	Faculty in my department are not encouraged to incorporate writing in their courses	3085	1369

**Table S7: Factors informing faculty assigning writing in the classroom –  $n_w$  for each question.** The value for  $n_w$  is rounded to the nearest whole number.

		$n_w$ - Faculty who assign writing	$n_w$ - Faculty who do not assign writing
<i>Social Factors</i>			
1	I use teaching practices for writing that are very similar to those that I experienced as a student	3113	1372
2	I have colleagues who share with me strategies and ideas about incorporating writing	3111	1372
<i>External Resources About Pedagogical Writing Use</i>			



3	I read literature regarding the incorporation of writing in my discipline	3110	1370
4	I communicate with our campus center for teaching and learning about incorporating writing in my classes	3109	1370
5	Professional development opportunities have helped me learn how to incorporate writing	3113	1370
6	I communicate with our campus writing center about using writing in the classroom	3111	1370

**Table S8: Significance between factors informing writing assignment within the WA group.** The upper right half contains the p values for the statistical analysis between factors informing use within the WA group (from weighted comparisons). Red indicates barriers that are not significant, with p values above the 0.05 significance level.

Factors Informing Use	1	2	3	4	5	6
1		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
2			< 0.001	< 0.001	< 0.001	< 0.001
3				< 0.001	1	< 0.001
4					< 0.001	< 0.001
5						< 0.001
6						

**Table S9: Significance between factors informing writing assignment within the WNA group.** The lower left half contains the p values for the statistical analysis between factors informing use within the WNA group (from weighted comparisons). Red indicates barriers that are not significant, with p values above the 0.05 significance level.

Factors Informing Use	1	2	3	4	5	6
1						
2	< 0.001					
3	< 0.001	< 0.001				
4	< 0.001	< 0.001	< 0.001			
5	< 0.001	< 0.001	1	< 0.001		
6	< 0.001	< 0.001	< 0.001	0.175	< 0.001	

**Table S10: Barriers to faculty assigning writing in the classroom – n<sub>w</sub> for each question.** The value for n<sub>w</sub> is rounded to the nearest whole number.

		n <sub>w</sub> - Faculty who assign writing	n <sub>w</sub> - Faculty who do not assign writing
<i>Instructional Constraints</i>			
1	My schedule is too full to develop materials and modify my course to include writing	3091	1375
2	Covering all the material in my course does not leave instructional time to incorporate writing	3090	1375
3	My course is too large to incorporate writing	3090	1375
4	I don't have sufficient resources (e.g. TAs) to incorporate writing in my course	3086	1373
5	I cannot incorporate writing because my TAs are not prepared to assess writing	3086	1367
<i>Personal Experience</i>			

6	I don't feel confident about using writing in my class	3085	1374
7	My previous attempts to incorporate writing were not successful	3083	1369
8	I am not aware of the research on the effectiveness on incorporating writing in my course to enhance student learning	3084	1371

**Table S11: Significance between factors that may decrease perceived behavioural control within the WA group.** The upper right half contains the p values from WA (from weighted comparisons). Red indicates barriers that are not significant, with p values above the 0.05 significance level. Orange indicates  $0.05 \geq p > 0.01$ , yellow  $0.01 \geq p > 0.001$ , and blue  $p \leq 0.001$ .

Factors	1	2	3	4	5	6	7	8
1		0.45	< 0.001	< 0.001	1	< 0.001	< 0.001	0.011
2			< 0.001	< 0.001	0.003	< 0.001	< 0.001	1
3				< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
4					0.007	< 0.001	< 0.001	< 0.001
5						< 0.001	< 0.001	< 0.001
6							< 0.001	< 0.001
7								< 0.001
8								

**Table S12: Significance between factors that may decrease perceived behavioural control within the WNA group.** The lower left contains the p values from WNA (from weighted comparisons). Red indicates barriers that are not significant, with p values above the 0.05 significance level. Orange indicates  $0.05 \geq p > 0.01$ , yellow  $0.01 \geq p > 0.001$ , and blue  $p \leq 0.001$ .

Factors	1	2	3	4	5	6	7	8
1								
2	< 0.001							
3	0.011	0.433						
4	< 0.001	1	0.001					
5	1	0.001	1	< 0.001				
6	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001			
7	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	1		
8	1	< 0.001	< 0.001	< 0.001	0.009	< 0.001	< 0.001	

#### SI – Open response analysis

Thirty percent ( $n = 1,343$ ) of faculty indicated that there were other factors guiding how they thought about using writing and 11% ( $n = 502$ ) indicated there were additional factors influencing their ability to assign writing. In both cases, 96% ( $n = 1,291$  and  $n = 483$ , respectively) of respondents, expanded on these factors through the open-ended questions. Initial analysis of the two sets of responses revealed overlap between the two questions in what participants wrote and so responses were combined during the complete analysis. We thematically analyzed their responses to develop a more nuanced understanding of factors beyond those provided in the survey. One of the authors grouped the responses based on common responses within each of the two questions then a second author read through and verified the groupings. The two authors then discussed the groupings to capture the themes of each.

**Table S13: Themes identified in the open-ended responses**

Theme	Description	Exemplar(s)
Student-focused influences	Faculty mention benefits for their students, such as supporting learning and developing skills important for the future, or being able to gauge student	“Writing reflects the quality of thinking and exposes misconceptions”

	understanding as influencing their incorporation of writing into their classes.	<p>“Writing is related closely to critical thinking skills, so writing can improve these skills significantly”</p> <p>“I believe communication is essential in science, and writing is an important component of science communication.”</p>
Sociocultural factors	Faculty mention sociocultural factors, such as past experiences and training as influencing their use of writing during instruction.	<p>“Classes on teaching pedagogy as a graduate student and postdoc”</p> <p>“Workshops offered by our teaching and learning center”</p> <p>“My work experience and personal knowledge of professional writing style for engineers.”</p>
Time constraints	Faculty identify time-related constraints as hindering their use of writing practices.	<p>“Time/content- should I focus more on introducing students to organic chemistry or to writing effectively?”</p> <p>“Time required to provide adequate feedback on writing practices to large class sizes”</p>
Connection between time and class size	Faculty connect class size and time constraints as hindering their use of writing practices.	<p>“Structure of large lecture courses without any TA support. I simply do not have time to adequately grade the writing assignments for 300+ students.”</p> <p>“Class size makes spending a lot of time on writing assignments prohibitively time consuming”</p>

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Question: Q1



**1. Indicate the level of courses you regularly teach**

*(check all that apply)*

- INTRODUCTORY UNDERGRADUATE COURSES
- UPPER DIVISION UNDERGRADUATE COURSES
- I DON'T TEACH UNDERGRADUATES

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**Collection:** Q2-Q9\_COLLECTION

**Contains:** Q2, Q3-Q7\_COLLECTION, Q8\_COLLECTION, Q9\_COLLECTION

**Show if:** (Q1 is-any-of [INTRODUCTORY UNDERGRADUATE COURSES] or [UPPER DIVISION UNDERGRADUATE COURSES])

**Question:** Q2

**Scale Summary**

Code	Label	Show-If
1	YES	
5	NO	



**2. Do you assign writing in any of the undergraduate courses that you teach?**

- YES  
 NO

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**Collection:** Q3-Q7\_COLLECTION  
**Contains:** Q3, Q4, Q5, Q6\_COLLECTION, Q7\_COLLECTION  
**Show if:** (Q2 = 1:[YES])

**For the next five questions respond in terms of one undergraduate course you regularly teach in which writing plays a role.**

**Question: Q3**

Scale Summary		
Code	Label	Show-If
1	25 or fewer	
2	25-50	
3	50-100	
4	100-500	
5	500-1000	
6	over 1000	

 **3. What is the usual size of this course?**


- 25 or fewer
- 25-50
- 50-100
- 100-500
- 500-1000
- over 1000

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Question: Q4

Scale Summary		
Code	Label	Show-If
1	EXCLUSIVELY NON-SCIENCE, NON-ENGINEERING MAJORS	
2	EXCLUSIVELY SCIENCE MAJORS	
3	EXCLUSIVELY ENGINEERING MAJORS	
4	MIXTURE OF SCIENCE AND ENGINEERING MAJORS	
5	MIXTURE OF SCIENCE AND ENGINEERING MAJORS AND NON-MAJORS	
7	OTHER (PLEASE BRIEFLY DESCRIBE YOUR STUDENT POPULATION)	

 **4. Who are the students that are typically enrolled in your course?**

- EXCLUSIVELY NON-SCIENCE, NON-ENGINEERING MAJORS
- EXCLUSIVELY SCIENCE MAJORS
- EXCLUSIVELY ENGINEERING MAJORS
- MIXTURE OF SCIENCE AND ENGINEERING MAJORS
- MIXTURE OF SCIENCE AND ENGINEERING MAJORS AND NON-MAJORS
- OTHER (PLEASE BRIEFLY DESCRIBE YOUR STUDENT POPULATION)

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Question: Q5



**5. What is the format of this course (select as many as apply)?**

- LECTURE (LARGE COURSE MEETING)
- SEMINAR
- LAB
- DISCUSSION SECTION
- FIELD-BASED
- OTHER (SPECIFY)

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**Collection:** Q6\_COLLECTION  
**Contains:** Q6, Q6\_N1

**Question Block:** Q6

**Contains:** Q6\_A, Q6\_B, Q6\_C, Q6\_D, Q6\_E, Q6\_F, Q6\_G, Q6\_H, Q6\_I, Q6\_J, Q6\_K, Q6\_L, Q6\_M, Q6\_N

**Scale Summary**

Code	Label	Show-If
1	9 or MORE	
2	6-8	
3	3-5	
4	1-2	
0	NONE	

 **6. During the last academic year, how many times did you assign your students in this class to write in the following genres?**

	9 or MORE	6-8	3-5	1-2	NONE
PROPOSAL (GRANT OR PROJECT)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
POSTER PRESENTATION	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ABSTRACT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SHORT IN-CLASS WRITING (E.G. MINUTE WRITING)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
WRITING IN RESPONSE TO CONCEPT-RELATED PROMPTS (FORMATIVE EVALUATION)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SHORT ANSWER ESSAY (ON QUIZ OR EXAM)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DISCIPLINE BASED TECHNICAL WRITING [E.G. LAB REPORTS]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SCIENTIFIC PAPER (BASED ON OWN RESEARCH)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RESEARCH LITERATURE REVIEW PAPER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
THESIS (CAPSTONE PROJECT)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FIELD NOTES	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANNOTATED BIBLIOGRAPHY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ONLINE DISCUSSION/BLOGS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SOME OTHER GENRE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**Question:** Q6\_N1  
**Show if:** (Q6\_N ≠ 0:[NONE]) and (Q6\_N was-answered)

 **6.2 Please specify other genre:**

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Collection: Q7\_COLLECTION

Contains: Q7

Question Block: Q7

Contains: Q7\_A, Q7\_B, Q7\_C, Q7\_D, Q7\_E, Q7\_F

Scale Summary		
Code	Label	Show-If
1	FIVE OR MORE	
2	FOUR	
3	THREE	
4	TWO	
5	ONE	
0	NONE	

 **7. During the last academic year, how many times did you require students to engage in the following writing practices in this course?**

	FIVE OR MORE	FOUR	THREE	TWO	ONE	NONE
LEARNING TO WRITE [E.G. WRITING ASSIGNMENTS THAT ARE DESIGNED TO CONTRIBUTE TO LEARNING TO WRITE IN A STYLE CONSISTENT WITH EXPECTATIONS FOR PUBLISHING IN SCIENTIFIC JOURNALS]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
WRITING TO LEARN [I.E. WRITING ASSIGNMENTS THAT ARE DESIGNED TO CONTRIBUTES TO THE LEARNING OF DISCIPLINARY CONTENTS]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
WRITING TO DEMONSTRATE MASTERY OF LEARNING OF FACTS/CONCEPTS/PRINCIPLES [E.G. SHORT ANSWER ESSAY ON TEST]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PEER REVIEW OF WRITING [I.E. STUDENTS SHARE THEIR WRITING WITH EACH OTHER AND PROVIDE FEEDBACK TO EACH OTHER]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
REVISING WRITING IN RESPONSE TO FEEDBACK	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DIVIDING A LONG PIECE OF WRITING, SUCH AS A RESEARCH PAPER, INTO SCAFFOLDED SECTIONS SO THAT STUDENTS RECEIVE SUPPORT AS THEY COMPLETE PARTS.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>


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**Collection:** Q8\_COLLECTION  
**Contains:** Q8, Q8\_G1, Q8\_G2

**Question Block:** Q8  
**Contains:** Q8\_A, Q8\_B, Q8\_C, Q8\_D, Q8\_E, Q8\_F

**Scale Summary**

Code	Label	Show-If
1	STRONGLY DISAGREE	
2	DISAGREE	
3	NEITHER AGREE NOR DISAGREE	
4	AGREE	
5	STRONGLY AGREE	

 **8. To what extent do you agree or disagree with the statements below?**

	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
I USE TEACHING PRACTICES FOR WRITING THAT ARE VERY SIMILAR TO THOSE THAT I EXPERIENCED AS A STUDENT.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I HAVE COLLEAGUES WHO SHARE WITH ME STRATEGIES AND IDEAS ABOUT INCORPORATING WRITING.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I READ LITERATURE REGARDING THE INCORPORATION OF WRITING IN MY DISCIPLINE (E.G. JOURNAL OF CHEMICAL EDUCATION, CBE-LIFE SCIENCES, PHYSICS EDUCATOR).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I COMMUNICATE WITH OUR CAMPUS CENTER FOR TEACHING AND LEARNING ABOUT INCORPORATING WRITING IN MY CLASSES.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PROFESSIONAL DEVELOPMENT OPPORTUNITIES HAVE HELPED ME LEARN HOW TO INCORPORATE WRITING.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I COMMUNICATE WITH OUR CAMPUS WRITING CENTER ABOUT USING WRITING IN THE CLASSROOM.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**Question:** Q8\_G1**Scale Summary**

Code	Label	Show-If
1	YES	
0	NO	

**8.1 Are there other factors that shape your pedagogical use of writing?**

- YES  
 NO

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**Question:** Q8\_G2  
**Show if:** (Q8\_G1 = 1:[YES])

 **8.2 What are these factors?**

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Page Break

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**Collection:** Q9\_COLLECTION  
**Contains:** Q9, Q9\_K, Q9\_K1, Q9\_K2

**Question Block:** Q9

**Contains:** Q9\_A, Q9\_B, Q9\_C, Q9\_D, Q9\_E, Q9\_F, Q9\_G, Q9\_H, Q9\_I, Q9\_J

**Scale Summary**

Code	Label	Show-If
1	STRONGLY DISAGREE	
2	DISAGREE	
3	NEITHER AGREE NOR DISAGREE	
4	AGREE	
5	STRONGLY AGREE	

 **9. To what extent do you agree or disagree that the factors described in the statements below have influenced your use of writing in your teaching?**

	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
MY SCHEDULE IS TOO FULL TO DEVELOP MATERIALS AND MODIFY MY COURSE TO INCLUDE WRITING.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
COVERING ALL THE MATERIAL IN MY COURSE DOES NOT LEAVE INSTRUCTIONAL TIME TO INCORPORATE WRITING.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MY COURSE IS TOO LARGE TO INCORPORATE WRITING.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I DON'T FEEL CONFIDENT ABOUT USING WRITING IN MY CLASS.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
WRITING IS NOT IMPORTANT IN MY DISCIPLINE.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I DON'T HAVE SUFFICIENT RESOURCES (E.G. TAs) TO INCORPORATE WRITING IN MY COURSE.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I CANNOT INCORPORATE WRITING BECAUSE MY TAs ARE NOT PREPARED TO ASSESS WRITING.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FACULTY IN MY DEPARTMENT ARE NOT ENCOURAGED TO INCORPORATE WRITING IN THEIR COURSES.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MY PREVIOUS ATTEMPTS TO INCORPORATE WRITING WERE NOT SUCCESSFUL.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I AM NOT AWARE OF THE RESEARCH ON THE EFFECTIVENESS ON INCORPORATING WRITING IN MY COURSE TO ENHANCE STUDENT LEARNING.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**Question:** Q9\_K

**Scale Summary**

Code	Label	Show-If
1	YES	
0	NO	



**9.1 Any other influences on your use of writing in your teaching?**

- YES  
 NO


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Page Break

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**Question:** Q9\_K1  
**Show if:** (Q9\_K = 1:[YES])

 **9.2 Please specify other influence:**

**Question:** Q9\_K2  
**Show if:** (Q9\_K = 1:[YES])

Scale Summary		
Code	Label	Show-If
1	STRONGLY DISAGREE	
2	DISAGREE	
3	NEITHER AGREE NOR DISAGREE	
4	AGREE	
5	STRONGLY AGREE	

 **9.3 To what extent do you agree or disagree that this factor has influenced your use of writing in your teaching?**

- STRONGLY DISAGREE  
 DISAGREE  
 NEITHER AGREE NOR DISAGREE  
 AGREE  
 STRONGLY AGREE

Page Break

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**Collection:** Q10\_COLLECTION  
**Contains:** Q10

**Question Block:** Q10

**Contains:** Q10\_A, Q10\_B, Q10\_C, Q10\_D, Q10\_E, Q10\_F

Scale Summary		
Code	Label	Show-If
1	NOT EFFECTIVE	
2	RARELY EFFECTIVE	
3	SOMEWHAT EFFECTIVE	
4	VERY EFFECTIVE	

 **10. Please indicate your view of the effectiveness of the following writing practices in promoting student's learning of STEM content knowledge (concepts/principles) in undergraduate science courses.**

	NOT EFFECTIVE	RARELY EFFECTIVE	SOMEWHAT EFFECTIVE	VERY EFFECTIVE
LEARNING TO WRITE [I.E. INSTRUCTION ABOUT WRITING IN A STYLE CONSISTENT WITH EXPECTATIONS FOR PUBLISHING IN SCIENTIFIC JOURNALS]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
WRITING TO LEARN [I.E. WRITING ASSIGNMENTS THAT ARE DESIGNED TO CONTRIBUTE TO THE LEARNING OF DISCIPLINARY CONTENT ]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
WRITING TO DEMONSTRATE MASTERY OF LEARNING OF FACTS/CONCEPTS/PRINCIPLES [I.E. SHORT ANSWER ESSAY ON TEST]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PEER REVIEW OF WRITING [I.E. STUDENTS SHARE THEIR WRITING WITH EACH OTHER AND PROVIDE FEEDBACK TO EACH OTHER]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
REVISING WRITING IN RESPONSE TO FEEDBACK	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SCAFFOLDING SECTIONS OF A LONG PIECE OF WRITING SUCH AS A THESIS OR CAPSTONE PROJECT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**13. The next four questions address issues surrounding ways of knowing.**

Question: Q13		
Scale Summary		
Code	Label	Show-If
1	a. Knowledge is constructed and uncertain and consists of opinions and interpretations that are subjective. People are entitled to their own opinion, and thus there are no bases on which to judge the merits of knowledge claims.	
2	b. Knowledge is constructed, imperfect, and provisional and consists of objectively verifiable facts and subjective opinions and interpretations. The merits of knowledge claims can be judged against alternative claims on the basis of the quality of the arguments and evidence.	
3	c. Knowledge is discovered and consists of facts that have been determined to be true and about which we can be certain. Knowledge claims are verifiable as right or wrong on the basis of objective evidence and standards.	



**People hold different views about what constitutes knowledge about our physical and social world. Three general perspectives have been identified.**

**Please indicate which perspective best reflects your discipline-based view**

- a. Knowledge is constructed and uncertain and consists of opinions and interpretations that are subjective. People are entitled to their own opinion, and thus there are no bases on which to judge the merits of knowledge claims.
- b. Knowledge is constructed, imperfect, and provisional and consists of objectively verifiable facts and subjective opinions and interpretations. The merits of knowledge claims can be judged against alternative claims on the basis of the quality of the arguments and evidence.
- c. Knowledge is discovered and consists of facts that have been determined to be true and about which we can be certain. Knowledge claims are verifiable as right or wrong on the basis of objective evidence and standards.

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Collection: Q14\_COLLECTION

Contains: Q14

Question Block: Q14

Contains: Q14\_A, Q14\_B, Q14\_C, Q14\_D, Q14\_E, Q14\_F, Q14\_G, Q14\_H

## Scale Summary

Code	Label	Show-If
1	STRONGLY DISAGREE	
2	DISAGREE	
3	NEITHER AGREE NOR DISAGREE	
4	AGREE	
5	STRONGLY AGREE	

 **14. Indicate the extent to which you believe the following statements characterize your discipline.**

In this discipline...	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
KNOWLEDGE CLAIMS ARE VERIFIABLE AS RIGHT OR WRONG ON THE BASIS OF OBJECTIVE EVIDENCE AND STANDARDS.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PROPOSITIONS AND HYPOTHESES ARE SUBJECT TO POTENTIAL DISCONFIRMATION.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
REPLICATION OF FINDINGS IS EMPHASIZED.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EMPIRICAL FINDINGS ARE EXPLAINED DEDUCTIVELY BY REFERRING BACK TO GENERAL PRINCIPLES AND DEFINITIONS, WHICH LEADS TO FURTHER HYPOTHESES THAT CAN BE TESTED.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EXPLANATORY MODELS ARE INDUCTIVELY CONSTRUCTED TO EXPLAIN FINDINGS THAT LEAD TO FURTHER HYPOTHESES THAT CAN BE TESTED.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KNOWLEDGE CLAIMS ARE EVALUATED AGAINST ALTERNATIVE CLAIMS BASED ON THE QUALITY OF ARGUMENTS AND EVIDENCE.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EXPERTS MAY COME UP WITH DIFFERING EXPLANATIONS OF THE SAME DATA.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PRINCIPLES ARE UNCHANGING.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**15. For each of the following, please select the statement that best characterizes your discipline.**

**Question: Q15\_MY\_DISCIPLINE**

Scale Summary		
Code	Label	Show-If
1	1. PRIMARILY MECHANISM-BASED (MECHANISM-BASED EXPLANATIONS INVOLVE REASONING INDUCTIVELY FROM OBSERVED PHENOMENA AND BUILDING CAUSAL RELATIONSHIPS AMONG SUCH PHENOMENA)	
2	2. BOTH MECHANISM AND THEORY-BASED	
3	3. PRIMARILY THEORY BASED	

 **My discipline is ...**

1. PRIMARILY MECHANISM-BASED (MECHANISM-BASED EXPLANATIONS INVOLVE REASONING INDUCTIVELY FROM OBSERVED PHENOMENA AND BUILDING CAUSAL RELATIONSHIPS AMONG SUCH PHENOMENA)
2. BOTH MECHANISM AND THEORY-BASED
3. PRIMARILY THEORY BASED

**Question: Q15\_MY\_DISCIPLINE\_USES**


Scale Summary		
Code	Label	Show-If
1	1. PRIMARILY STATISTICAL CONTROL	
2	2. BOTH STATISTICAL AND EXPERIMENTAL CONTROL	
3	3. PRIMARILY EXPERIMENTAL CONTROL	

 **My discipline uses ...**

1. PRIMARILY STATISTICAL CONTROL
2. BOTH STATISTICAL AND EXPERIMENTAL CONTROL
3. PRIMARILY EXPERIMENTAL CONTROL

**Question: Q15\_MY\_DISCIPLINE\_SUBJECT\_MATT**

Scale Summary		
Code	Label	Show-If
1	1. PRIMARILY OBSERVABLE	
2	2. BOTH OBSERVABLE AND CONCEPTUAL	
3	3. PRIMARILY CONCEPTUAL	

 **My discipline's subject matter is ...**


1. PRIMARILY OBSERVABLE
2. BOTH OBSERVABLE AND CONCEPTUAL
3. PRIMARILY CONCEPTUAL

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Question: Q16

Scale Summary		
Code	Label	Show-If
1	A SINGLE PARADIGM	
2	2-3 PARADIGMS	
3	MULTIPLE PARADIGMS	

 **16. A paradigm is an accepted model for the work in a discipline, and includes 1) the types of questions that are posed and considered solvable, 2) methods of inquiry and analysis, and 3) criteria for evaluating and accepting knowledge claims. In your view, does your discipline rely primarily upon**

- A SINGLE PARADIGM
- 2-3 PARADIGMS
- MULTIPLE PARADIGMS

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**Question: Q17**

Scale Summary		
Code	Label	Show-If
1	MALE	
2	FEMALE	
7	OTHER	
9	PREFER NOT TO RESPOND	

**17. Please indicate your gender**

- MALE
- FEMALE
- OTHER
- PREFER NOT TO RESPOND

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Question: Q18



**18. Please indicate your Racial/Ethnic background (check as many as apply)**

- AFRICAN AMERICAN OR BLACK
- ASIAN/PACIFIC ISLANDER
- HISPANIC OR LATINO
- NATIVE AMERICAN OR AMERICAN INDIAN
- WHITE
- OTHER


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**Question: Q19**

Scale Summary		
Code	Label	Show-If
1	CHEMISTRY	
2	COMPUTER SCIENCE	
3	ENGINEERING	
4	ENVIRONMENTAL SCIENCE	
5	GEOSCIENCES	
6	LIFE/BIOLOGICAL SCIENCES	
7	MATHEMATICS	
8	PHYSICS/ASTRONOMY	
9	OTHER (SPECIFY)	

 **19. Please indicate your discipline**

- CHEMISTRY
- COMPUTER SCIENCE
- ENGINEERING
- ENVIRONMENTAL SCIENCE
- GEOSCIENCES
- LIFE/BIOLOGICAL SCIENCES
- MATHEMATICS
- PHYSICS/ASTRONOMY
- OTHER (SPECIFY)

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**Question: Q20**

Scale Summary		
Code	Label	Show-If
1	1-5	
2	6-10	
3	11-15	
4	16-20	
5	over 20	

**20. Please indicate the number of years you have taught**

- 1-5
- 6-10
- 11-15
- 16-20
- over 20

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**Collection:** Q21\_COLLECTION

**Contains:** Q21

**Show if:** (Q1 is-any-of [INTRODUCTORY UNDERGRADUATE COURSES] or [UPPER DIVISION UNDERGRADUATE COURSES])

**Question:** Q21

**Scale Summary**

Code	Label	Show-If
0	0	
1	1	
2	2	
3	3	
4	4	

 **21. How many undergraduate courses do you teach per year?**


- 0
- 1
- 2
- 3
- 4

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**Question: Q22****Scale Summary**

Code	Label	Show-If
0	0	
1	1	
2	2	
3	3	
4	4	

 **22. How many graduate courses do you teach per year?**

- 0
- 1
- 2
- 3
- 4

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Question: Q23

Scale Summary		
Code	Label	Show-If
1	ASSISTANT PROFESSOR	
2	ASSOCIATE PROFESSOR	
3	FULL PROFESSOR	
4	LECTURER	
5	POST DOC	
6	GRADUATE STUDENT	
7	OTHER - SPECIFY	

**23. Please indicate your position**

- ASSISTANT PROFESSOR
- ASSOCIATE PROFESSOR
- FULL PROFESSOR
- LECTURER
- POST DOC
- GRADUATE STUDENT
- OTHER - SPECIFY

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<b>Question:</b> EMAIL_ADDRESS		
<b>Scale Summary</b>		
Code	Label	Show-If
1	Email Address:	



**If you wish to be provided with a summary of the results from this study please enter your email below.**

Email Address:

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**Question:** STUDY\_EXTENSION

Scale Summary		
Code	Label	Show-If
1	Yes. Please include your email address here.	
2	No	



**In an extension of this study, we plan to interview some survey respondents to better understand their responses to the survey and their views of writing in STEM. If you are willing to participate in an interview, which will be conducted by Skype or phone, please indicate below. Please note that if you prefer not to participate in an interview, your responses will remain de-identified and anonymous.**

- Yes. Please include your email address here.
- No

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